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US 3543872

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(71) Applicant
Texas Industries Inc., (Netherlands Antilles), Willemstad, Curacao, Netherland Antilles

(72) Inventor
Cornelis van der Lely

(74) Agent and/or address for service
Haseltine Lake & Co., Hazlitt House, 28 Southampton Buildings, Chancery Lane, London, WC2A 1AT

(54) A Motor Vehicle

(57) A motor vehicle in the form of an agricultural tractor comprises steerable wheels (38) which are mounted on a tubular steering member (75). The steering member (75) is releasably fastened to a bearing comprising a bearing plate (82) disposed between retaining plates (87, 89) secured to the frame of the tractor. The retaining plates (87, 89) are spaced apart by a spacer plate (88).

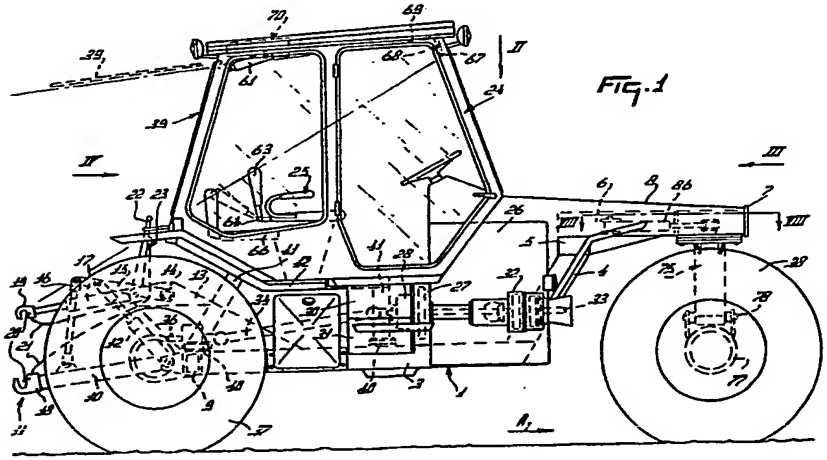

FIG. 1

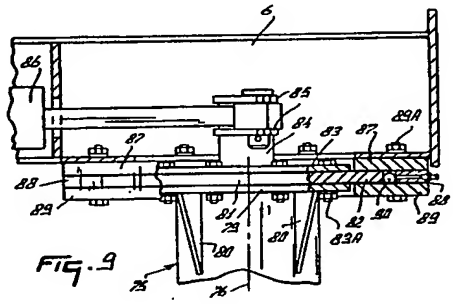

FIG. 2

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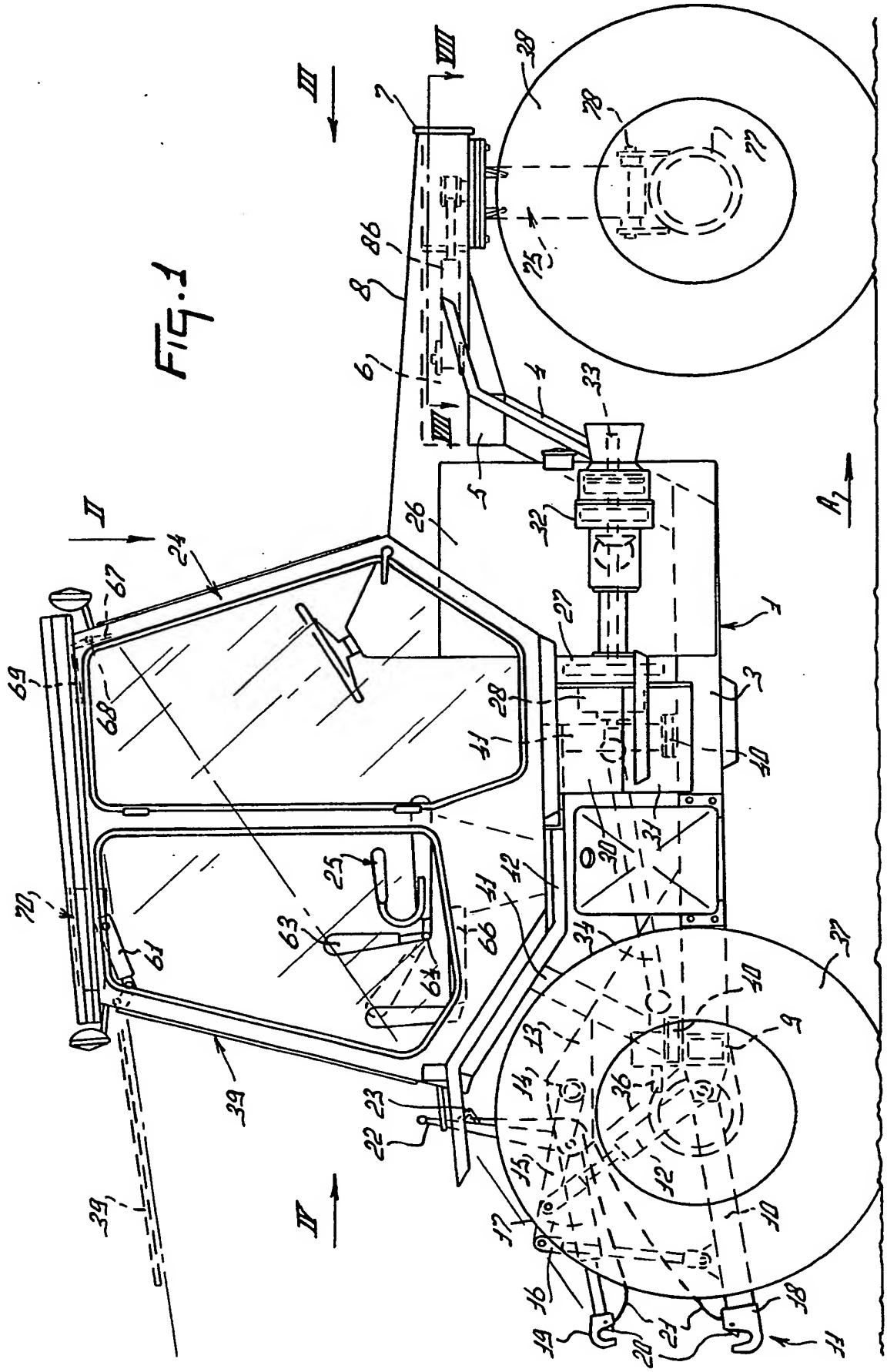

FIG.1

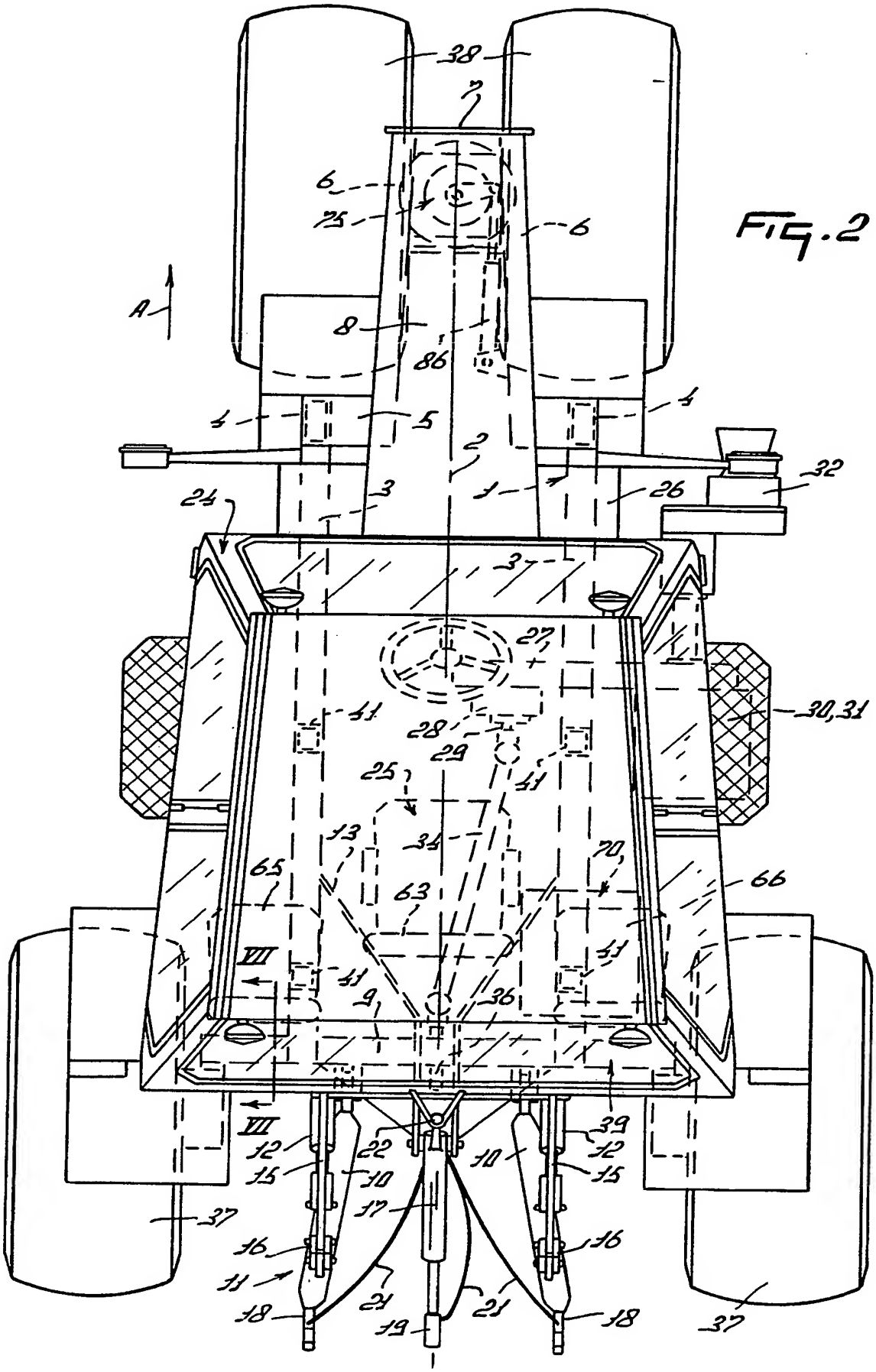
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FIG.2

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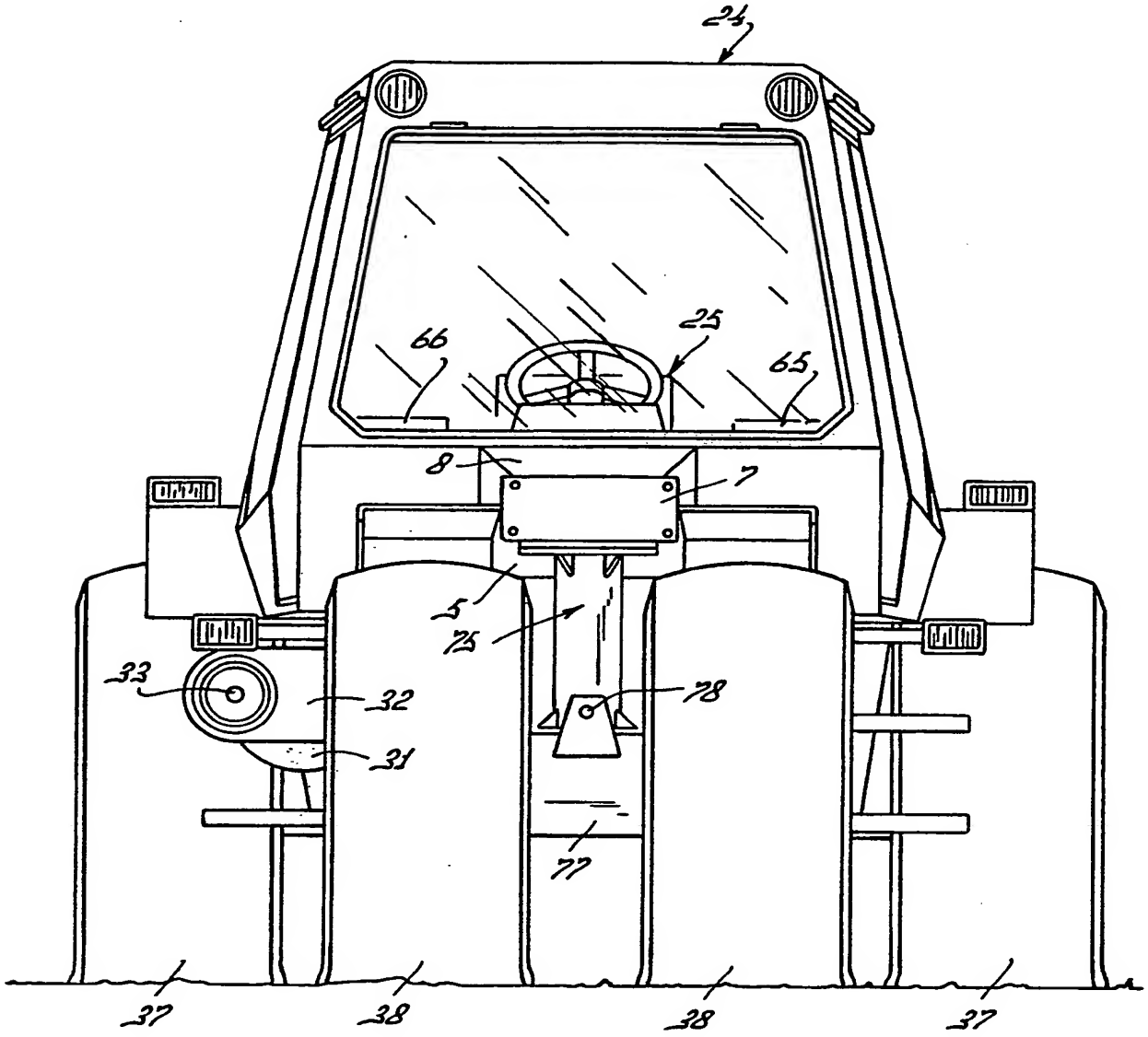

FIG.3

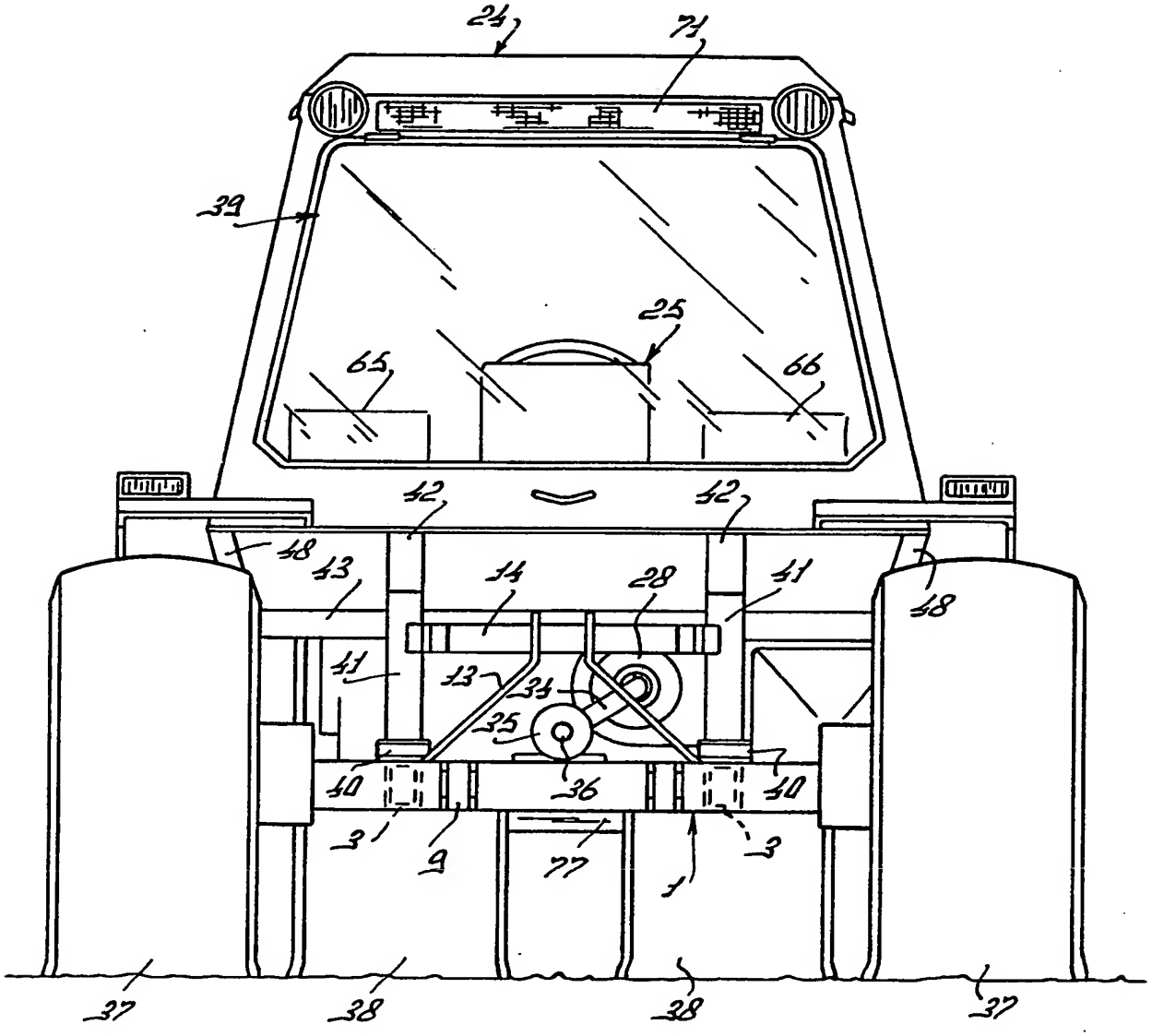
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FIG. 4

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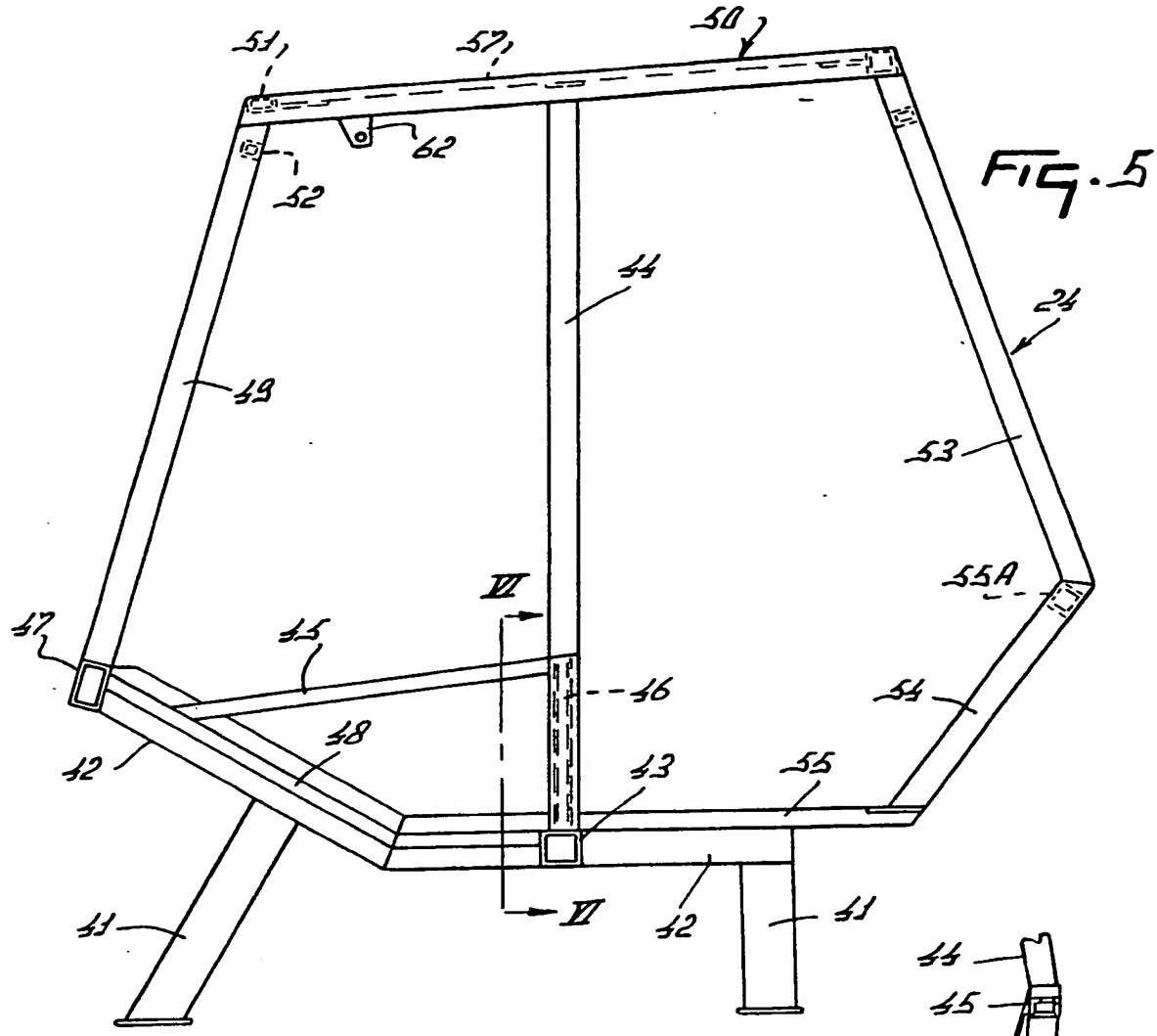

FIG. 5

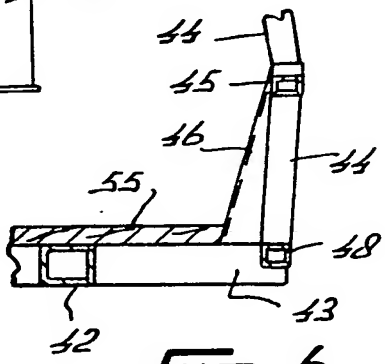

FIG. 6

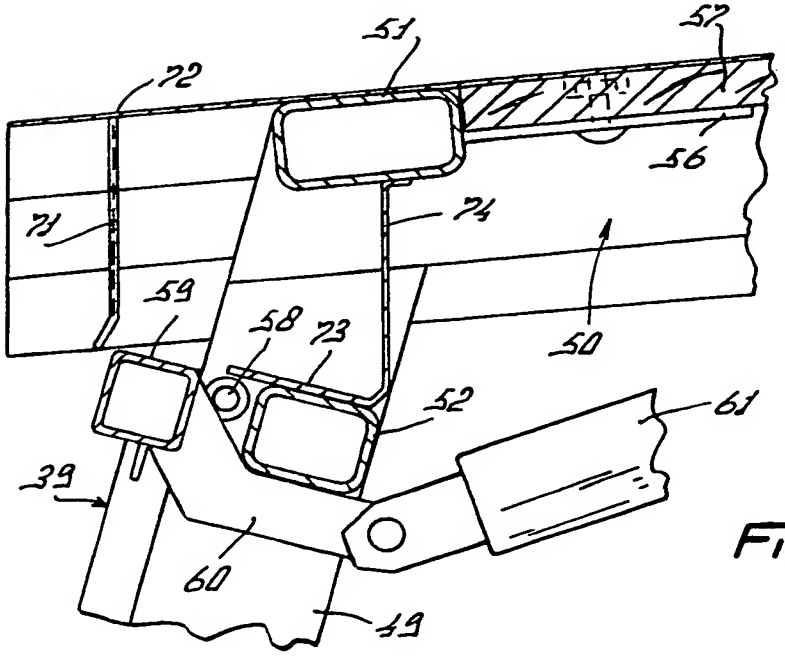

FIG. 7

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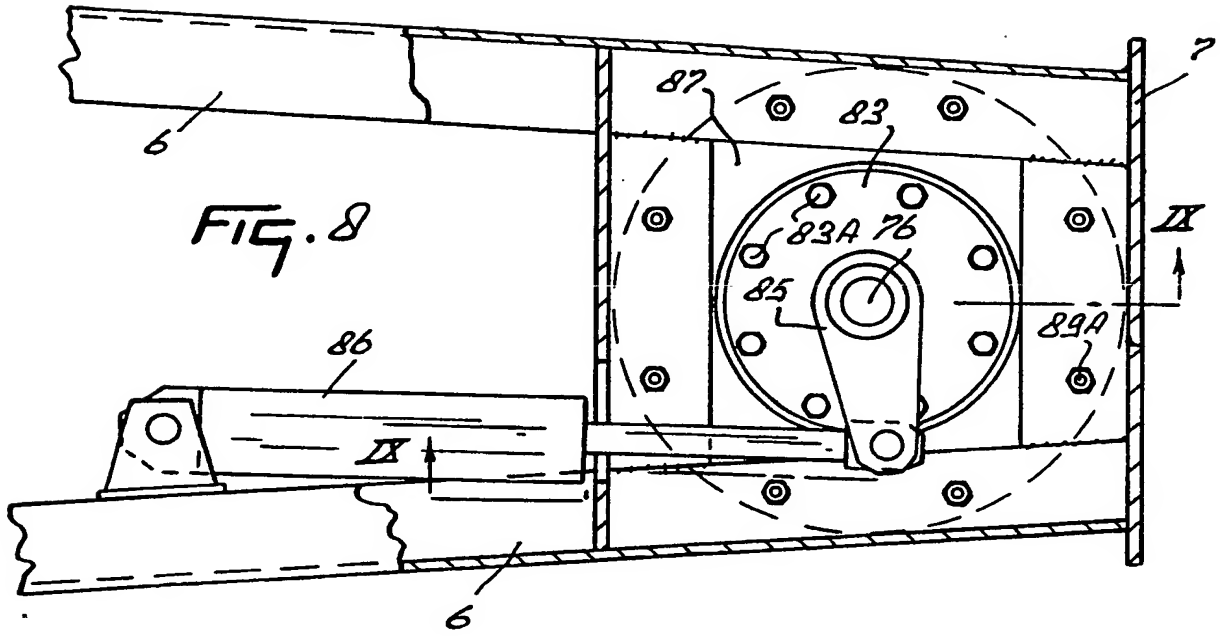

FIG. 8

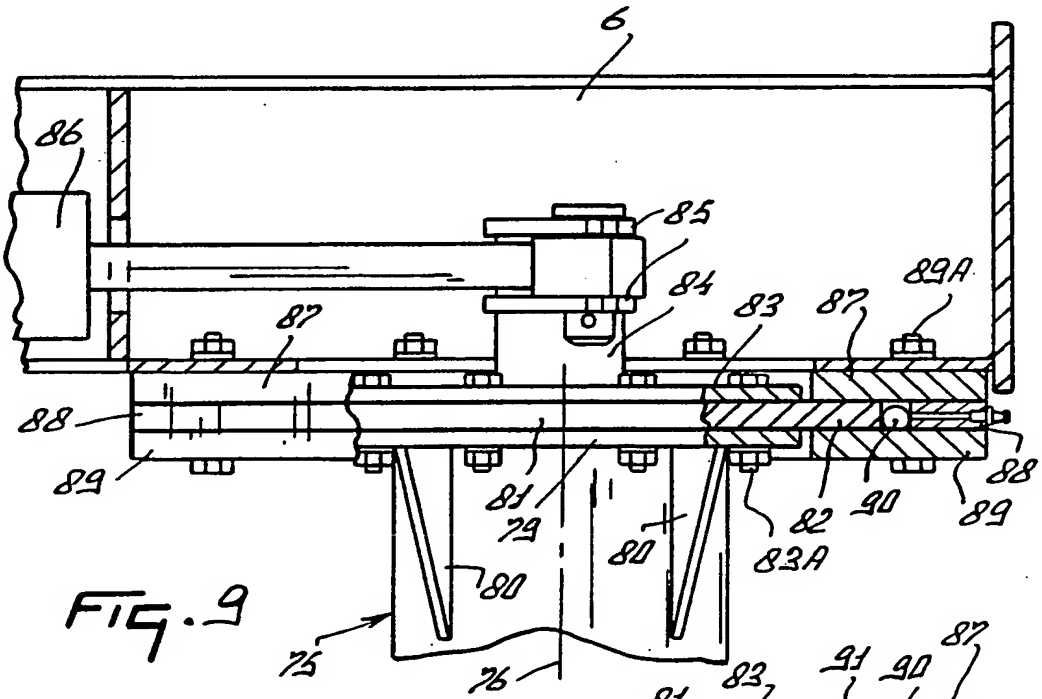

FIG. 9

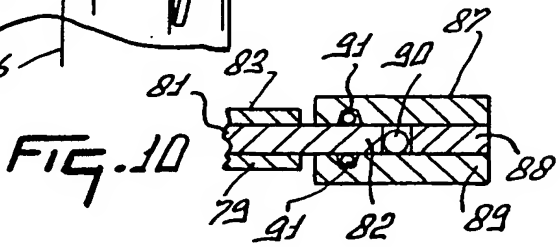

FIG. 10

SPECIFICATION

A Motor Vehicle

This invention relates to motor vehicles, and particularly, although not exclusively, to an agricultural tractor.

According to the present invention there is provided a motor vehicle comprising a steerable wheel mounted on an upwardly extending steering member which is releasably secured to a bearing of the steering member.

An embodiment in accordance with the present invention provides a simple and cheap connection of the steerable wheel and ensures that the wheel with its carrying construction can be removed in a simple manner without dismantling the pivotable connection. At the same time the pivotable connection of the wheel is rugged, wear-resistant and rigid and causes little friction. Assembly of the connection does not require accurate adjustment.

For a better understanding of the present invention, and to show how it may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1 is a side view of a tractor;

Figure 2 is a plan view of the tractor;

Figure 3 is a front view of the tractor;

Figure 4 is a rear view of the tractor;

Figure 5 is a side view of a frame of a cab of the tractor;

Figure 6 is a sectional view taken on the line VI—VI in Figure 5;

Figure 7 is a sectional view taken on the lines VII—VII in Figure 2;

Figure 8 is a partly sectioned plan view taken on the lines VIII—VIII in Figure 1;

Figure 9 is a partly sectioned view taken on the lines IX—IX in Figure 8; and

Figure 10 shows an alternative construction for parts shown in Figure 9.

The tractor comprises a frame 1, which is symmetrical about a vertical longitudinal central plane 2 (Figures 1 and 2). The frame 1 comprises two substantially horizontal parallel beams 3 extending forwardly from the rear of the frame. At their front ends, the beams 3 are provided with supporting beams 4 which slope upwardly and forwardly, with respect to the intended direction of normal operative travel, indicated by an arrow A. Like the beams 3, the supporting beams 4 are parallel to the plane 2. A horizontal tie beam 5, which is normal to the plane 2, is fastened to the top ends of the two supporting beams 4. Two horizontal angle irons or L-profiles 6 are fastened to the top of the tie beam 5 and extend forwardly away from the beam 5. The angle irons 6 are spaced from each other and converge slightly towards the front.

The front ends of the angle irons 6 are rigidly secured to each other by a vertical end plate 7, which is normal to the plane 2. The angle irons 6 are disposed with one face horizontal, these horizontal faces extending towards each other from the vertical face. They are covered throughout their common width by a cover plate 8. The supporting beams 4 and the angle irons 6 constitute a gooseneck front end of the frame 1, below which front wheels are situated, as will be discussed later in this description. The height of the beams 3 above the ground is equal to half the diameter of the tractor wheels. These beams 3 are rigidly interconnected at their ends by a horizontal tie beam 9, which is normal to the plane 2 and which is provided at the rear with rearwardly projecting lugs which receive horizontal pins disposed at right angles to the plane 2. Lower lifting arms 10 of a rear three-point lifting device 11 are pivotable about these pins. The beam 9 has further lugs, which also receive pins normal to the plane 2 about which the lower ends of hydraulic rams 12 are pivotable. As is shown in Figure 2, the lower lifting arms 10 are slanted slightly outwardly and rearwardly away from the frame 1. Also, each hydraulic ram 12 is pivotally connected to the tie beam 9 at a position a short distance to the outboard side of the position at which the adjacent lower lifting arm 10 is connected to the frame.

Figures 2 and 4 show support plates 13 which are welded to the rear portions of the two beams 3 and extend upwardly and inwardly towards the plane 2. Near the plane 2, the plates 13 are bent upwardly to extend parallel to the plane 2. These upper parts of the plates 13 support a tube 14 which extends normal to the plane 2. A shaft is journalled in the tube 14 and carries rearwardly extending pivotable arms 15. The ends of the arms 15 away from the tube 14 are pivotally connected by a lifting arm 16 with the respective lower lifting arms 10. At a point between the free end of each arm 15 and the tube 14 there is a pivotal shaft extending at right angles to the plane 2, about which the free end of the piston rod of the associated hydraulic ram 12 is pivotable. The top parts of the support plates 13 also carry a pivotal shaft which is normal to the plane 2, about which a rearwardly extending upper lifting arm 17 is pivotable. The free end of each lower lifting arm 10 is provided with a coupling member 18 in the form of an upwardly open hook. In a similar manner, the free end of the upper lifting arm 17 is provided with a coupling member 19 in the form of a downwardly opening hook. The hooks 18 and 19 each have a quick-action latch comprising a latch bolt 20 which is pivotable about an axis at right angles to the plane 2, which can retain a stub shaft or a length of pipe of a machine attached to the lifting device 11 in the hooks 18 and 19 during operation. The latch bolts 20 can be operated by cords or cables 21, which extend upwardly and forwardly away from the respective pivotable latch bolts.

Near the pivotal shaft of the top lifting arm 17, a lever 22 is rigidly secured to the arm 17. This lever 22 extends upwardly from the arm 17. The angle between the top lifting arm 17 and the lever 22 is about 110°. Near the upper free end of the lever 22 there is a bracket 23 for suspending the

cords 21. The tractor has a cab 24 in which there is a driver's seat 25 from which the lifting device 11 can be hydraulically actuated.

Near the front ends of the beams 3 there is a driving engine 26 which is fastened to the beams 3 and to the beams 4 in a position which is slightly offset with respect to the plane 2, with the result that its crankshaft, emerging from the rear of the engine, is disposed to one side of the plane 2. The engine 26 has a power of 60 to 100 kw and its crankshaft constitutes an input shaft of a gear box 27, which is fastened to the rear of the engine 26 and extends laterally over a distance beyond the frame beam 3 on the same side of the plane 2 as the crankshaft and beyond the outer boundary faces of the front wheel of the tractor on that side. To the rear of the gear box 27 is fastened a change-speed gear 28 which is actuable from the driver's seat 25, the input shaft of which coincides with an output shaft of the gear box 27. The output shaft 29 of the change speed gear 28 projects to the rear. The shaft 29 may be in line with the crankshaft of the engine 26 and thus be disposed, as viewed on plan, between the frame beams 3 but on one side of the plane 2. To the rear of the end of the gear box 27 extending beyond the frame are fastened two pumps 30 and 31, which are driven by output shafts of the gear box 27 and have a fluid displacement that can be adjusted from the driver's seat 25. The pump 30 serves to drive the rear wheels of the tractor and the pump 31 serves to drive the front wheels of the tractor. The front of the gear box 27 is provided with a gear wheel transmission 32 having an output shaft 33, which projects in the direction A away from the gear wheel transmission and constitutes a front power take-off shaft. As is shown in Figures 2 and 3, the power take-off shaft 33 is disposed away from the plane 2 and is outboard of the outer face of the front wheel on the same side of the tractor.

The output shaft 29 of the change-speed gear 28 is coupled by means of an auxiliary shaft 34 provided with two universal joints to a rear power take-off shaft 26 supported in a bearing 35, the horizontal centre line of which lies in the plane 2. The bearing 35 is supported on the top of the tie beam 9.

The tractor has in total two rear wheels 37 located one on each side of the plane 2. Each of the rear wheels 37 can be driven by an associated hydraulic motor (not shown), the fluid displacement of which can be adjusted by the driver from the driver's seat 25. The hydraulic motors of the rear wheels 37 are supplied by the hydraulic pump 30.

The tractor has in total two front wheels 38, also located one on each side of the plane 2. The track width of the front wheels 38 is about 90 cms and the track width of the rear wheels 37 is about 240 cms. All of the wheels have the same diameter which is about 135 cms. All of the wheels are provided with pneumatic tyres, which are preferably low pressure tyres having a width of about 60 cms. With this disposition of the front wheels 38 and the rear wheels 37 the front wheels 38 are located inside the track of the rear wheels 37 so that the tractor bears on the ground over an overall width of about 240 cms. In this way the ground pressure is very low so as to avoid deterioration of the soil structure which may affect the future growth of crops. The overall width of the tractor is about 300 cms.

As shown in the side elevation of Figure 1, the cab 24 extends forwardly from a vertical plane containing the rotary axes of the rear wheels 37 over a length of about 200 cms. The largest width of the cab 24 measured at right angles to the plane 2 is 200 cms so that the rear of the cab (Figure 2) is partly situated above the rear wheels 37. The side walls of the cab are substantially flat and diverge towards the rear. These side walls each comprise a door and a window pane which are substantially coplanar. At the front, the cab has a width of about 160 cms. The rear wall of the cab has a rear windscreen 39, whose height (about 100 cms) is smaller than its maximum width (about 170 cms).

The tops of the frame beams 3 are provided with blocks 40 of a material suitable for damping mechanical vibrations, for example, rubber-like material. Upwardly extending front and rear supports 41 are secured to the tops of the blocks 40, for example by vulcanisation. The supports 41 are parallel to the plane 2. The rear supports 41 slope forwardly from bottom to top, but the front supports 41 are substantially vertical. The two supports 41 located on each side of the plane 2 are fastened at their top ends to a supporting beam 42 of the cab 24. The rear part of each of the two supporting beams 42 slopes upwardly from front to rear while the front part of each beam, which is rigidly secured to the rear part, is substantially horizontal and is fastened to the respective front support 41 near its front end (Figure 5). At a position substantially midway along the length of the front horizontal part of each supporting beam 42 there is welded a carrying beam 43 which is normal to the plane 2 and which extends between the two supporting beams 42 disposed one on each side of the plane 2 and projects outwardly beyond the supporting beams 42. Columns 44 are welded to the two outer ends of the carrying beam 43, these columns 44 comprising rectangular, hollow members and extending upwardly from the carrying beam 43 to form part of the side walls of the cab. As is shown in Figures 5 and 6, each column 44 is supported by a stay beam 45, which is welded at one end to the column some distance above the carrying beam 43, and at the other end to the rear, sloping part of the supporting beam 42. The stay beam 45 is also a rectangular, hollow member and constitutes the lower boundary of a window in the side wall of the cab. Each column 44 is also supported on its inboard side by a bracing plate 46, which extends upwardly from the carrying beam 43 to a position close to where the beams 44 and 45 meet each

other. The bracing plate 46 is rigidly secured to the beams 43 and 44 (Figure 6).

A transverse beam 47 is secured to the rear ends of the sloping parts of the supporting beams 42. The transverse beam 47 is at right angles to the plane 2 and extends outwardly beyond the supporting beams 42. On each side of the cab frame, a peripheral beam 48, which follows the shape of the supporting beam 42, extends between the projecting free end of the transverse beam 47 and the projecting end of the supporting beam 43. A rear pillar 49 is fastened to the top of the transverse beam 47 at the same position as the peripheral beam 48 on each side, this pillar sloping forwardly from bottom to top. The entire construction is symmetrical about the plane 2. The top ends of the two rear pillars 49 are fastened to a substantially trapezoidal metal framework, this framework 50 being fabricated from hollow members and comprising a supporting structure for the cab roof. The framework 50 is also symmetrical about the plane 2. The top end of the columns 44 support the side members of the framework 50 substantially midway along their length. The framework 50 comprises a rear hollow beam 51 which is at right angles to the plane 2 and a hollow member 52 disposed below and parallel to the beam 51 and serving as part of an opening for the rear windscreen of the cab. Front pillars 53 are rigidly secured near the front corner of the framework 50 and extend downwardly, sloping to the front from top to bottom. The front pillars 53 meet, at a position about two thirds of the way down the height of the cab, downwardly and rearwardly inclined posts 54. At or near the junction between each pillar 53 and post 54 there is a transverse beam 55A which extends between the constructions disposed symmetrically on each side of the plane 2.

A floor panel 55 is supported on the tops of the supporting beam 43, the two supporting beams 42 and the peripheral beams 48 disposed outboard of the beams 42. The floor panel 55 is made from a material other than metal, preferably from a wood-like or wood-based material, for example glued hardwood, chipboard, hardboard or plywood, having a thickness of about 40 mms. The floor panel 55 extends freely beyond the front end of the supporting beams 42 and the supports 41 and has its front edge region fastened to the underside of the posts 54. A roof panel 57 is secured in the roof framework 50 by fastening strips 56 welded to the hollow members of the framework 50 (Figure 7). The roof panel 57 is also made from woodlike or wood-based material having a thickness of about 15 mms.

The rear windscreen 39 is pivotable outwardly with respect to the rest of the cab 24 about a pivotal shaft 58 which extends at right angles to the plane 2 and is disposed near the top edge of the windscreen. This pivotal shaft is disposed directly behind the hollow member 52 situated below the hollow beam 51. The top element 59 of the frame of the rear windscreen 39 is pivotable about the pivotal shaft 58 by a lever 60, which is rigidly secured to the top element 59 and extends, when the windscreen 39 is closed, directly below the hollow member 52 towards the interior of the cab 24. The free end of the lever 60 is pivotally connected to the end of the piston rod of a hydraulic ram 61, the cylinder of which is pivotally mounted on a support 62, which is fastened to a side of the roof framework 50. The hydraulic ram 61 can be actuated from the driver's seat for opening the rear windscreen 39 by pivoting it to the rear.

In the cab, the driver's seat 25 is disposed symmetrically about the plane 2 and the back 63 of the seat is situated some distance in front of the rear windscreen. The back 63 can be turned from its upright position (Figure 1) to the rear about a pivotal shaft 64, at the level of the seat squab and normal to the plane 2, and can be fixed in various positions. The back 63 can be turned to the rear through an angle of about 45° and can be fixed in said position. In this position the top edge of the back 63 is located near the plane of the rear windscreen 39 when closed and near the lower edge of the windscreen. When, by actuating the hydraulic ram 61, the driver has opened the rear windscreen into the position indicated by broken lines in Figure 1 and has turned the back to the rear through about 45°, he can grasp unhindered the upper free end of the lever 22. This upper end of the lever 22 extends near to the rear lower edge of the opening of the rear windscreen 39 in the cab structure. Therefore, by turning the lever 22 the driver can, from his seat, turn up and down the upper lifting arm 17 of the lifting device 11 as desired for attaching machines to the tractor. The driver can also operate the cords or cables 21 separately for locking or unlocking the connection of machines to the lifting device 11 by means of the lock bolts 20.

As is shown in Figure 2, additional seats 65 and 66 are provided on both sides of the driver's seat 25. These additional seats 65 and 66 are disposed further to the rear than the driver's seat 25 so that the backs of the seats 65 and 66 are near the rear windscreen and, as viewed from the side, the fronts of these seats 65 and 66 are disposed near the rear of the driver's seat 25. During operation, several people can sit in the cab to monitor and control machine parts of complicated machine systems, in which machines or implements are hitched to both the front and the rear of the tractor.

Above the windscreen of the cab 24 there is a mirror 67 which is pivotable about a pivotal shaft 60 normal to the plane 2 by means of a lever 69 and is fixable in any one of a plurality of positions. The mirror has a width of 100 cms or more and a height of about 15 cms. The width of the mirror exceeds the width of the track of the two front wheels 38 and the width of the rear windscreen of 150 cms or more exceeds that of the mirror 67. In this way, using the mirror 67, people occupying the driver's seat and the additional seats 65 and

66 can see to the rear over a field of view extending above attached machines to the ground behind them but also including on the lower side the coupling points of the implements at the lifting device 11.

Above one of the additional seats, in this embodiment above the seat 66, there is an air conditioning system 70 which is screwed to the wooden roof panel of the cab. The air conditioning system, which sucks in air from the rear wall of the cab and blows the conditioned air forwardly, can heat, cool and dry the incoming air. Thus not only can the air in the cab be maintained at the desired temperature, but also visibility in all directions is maintained since the windows of the cab will not get misted up. The air inlet of the system 70 comprises a grille 71 in the space above the top element 59 of the opening of the rear windscreen and below a rearwardly projecting roof part 72. The supply duct for the air entering the system 70 is bounded by the roof (Figure 7), a wall 73 disposed on top of the hollow member 52 and an adjoining wall 74 extending upwardly from the front edge of the hollow member 52 to the underside of the hollow beam 51. The walls 73 and 74, like the grille 72, are at right angles to the plane 2 and cover substantially the whole width of the rear of the cab 24. Therefore, the air inlet is broader than the air inlet proper of the system 70 itself, which extends over only part of the width of the cab on one side of the plane 2.

At the front, the tractor has a steering shaft 75. The steering shaft 75 is pivotable about a pivotal axis 76, which, in the illustrated embodiment, is substantially vertical and lies in the plane 2. In other embodiments, the steering shaft 75 may be provided at its lower end with a single steerable wheel and it may be disposed away from the plane 2, but in the illustrated embodiment, the steering shaft provides a possibility of turning the two front wheels 38, which are disposed symmetrically about the plane 2. The steering shaft 75 is elongate and is constituted in the illustrated embodiment by a round tube, the centreline of which coincides with the pivotal axis 76. The steering shaft is situated in the gooseneck-shaped space below the interconnected angle irons 6 and in front of the upwardly extending supporting beams 4, in which space are also located the front wheels 38.

Each front wheel 38 is provided with a hydraulic motor supplied from the pump 31. The two front wheels 38 are rotatably journalled on a tubular front axle 77 which extends at right angles to the plane 2, when the front wheels are in the straight-ahead position, and is capable of accommodating the hydraulic motors. The front axle 77 is pivotable with respect to the steering shaft 75 by means of a horizontal pivotal shaft 78 located in the plane 2.

At its top end, the tubular steering shaft 75 is covered by a closing plate 79 which is at right angles to the pivotal axis 76 and is connected to the steering shaft by welds at its periphery. The closing plate 79 is circular and has a larger diameter than the steering shaft 75 so that the edge of the closing plate, centred on the pivotal shaft 76, extends beyond the steering shaft 75. This edge is supported by welded-on butresses 80 with respect to the tube 75. The edge region of the closing plate 79 lying beyond the steering shaft 75 has regularly spaced holes, the centrelines of which are parallel to the axis 76. The top face of the closing plate 79 abuts a bearing plate 81, which is also circular and centred on the axis 76.

The diameter of the bearing plate 81 exceeds that of the closing plate 79 so that the bearing plate 81 has an edge region 82 (Figure 9) extending beyond the periphery of the closing plate 79. The bearing plate 81 has all around a plurality of holes in register with the holes in the closing plate. The top face of the bearing plate 81 abuts a top plate 83, which is also centred on the axis 76 and which is also circular with the same diameter as the closing plate 79. The top plate 83 also has holes, the centrelines of which are in register with those of the holes in the closing plate 79 and the bearing plate 81. The plates 79, 81 and 83 are releasably coupled with one another by bolts 83A passing through these holes. A tubular support 84 is welded to the top face of the top plate 83. This tubular support 84 is centred on the centreline 76 and is provided with its ends above the top plate 83 with arms 85 which are rigidly secured to the support 84 and project, in the straight-ahead position of the wheels 38, substantially at right angles to the plane 2 to one side. The free ends of the arms 85 are connected by a vertical pivotal shaft with the end of the piston rod of a hydraulic ram 86, which is pivotable about a vertical pivotal shaft and connected with one of the angle irons 6 and hence with the frame 1 of the tractor for pivotal movement about a vertical axis.

An annular bearing housing plate 87 is rigidly secured to the lower flanges of the angle irons 6, this plate 87 being centred on the axis 76. The lower face of the bearing housing plate 87 abuts an annular spacer plate 88, which is also centred on the axis 76 and the thickness of which corresponds to that of the bearing plate 81 which is about 15 mm. The lower face of the spacer plate 86 abuts a lower bearing housing plate 89, which—as viewed on plan—has preferably but not necessarily the same shape and disposition as the upper bearing housing plate 87. The thicknesses are chosen so that the lower face of the bearing housing plate 87 coincides with the lower face of the top plate 83 in a manner such that the edge region 82 of the bearing plate 1 lies between the upper and lower bearing housing plates 87 and 89. The cylindrical outer face of the edge region 82 of the bearing plate 81 is radially spaced throughout the circumference by a constant distance from the inner edge of the spacer plate 88. Balls 90 are provided in the annular space left between the edge region 82 and the spacer plate 88 for radially locating the

steering shaft 75. The plates 87 to 89 are releasably interconnected by bolts 89A which are arranged around the outer region parallel to the axis 76 and to the bolts 83A.

An alternative construction is shown in Figure 10, in which the adjacent faces of the two bearing housing plates 87 and 89 and the upper and lower faces of the edge region 82 of the bearing plate 81 are provided with grooves containing balls 91 which are disposed in a continuous row centred on the centre line 76. The plates 87, 88 and 89 are preferably made from cast iron and the bearing plate 81 is made from steel, for example hardened steel. The bearing housing plates 87 and 89 and the spacer plate 88 have aligned holes, whose centre lines are parallel to the axis 76.

By actuating the hydraulic ram 86 from the driver's seat 25, the support 84 and the top plate 83 which is rigidly secured to it are turned about the axis 76 by means of the arms 85. The bearing plate 81 fastened to the top plate 83 by means of the bolts 83A is thus also turned while remaining supported in a radial direction by the row of balls 91 which are held in place by the annular plates 87, 88 and 89 which are fastened to the frame. This turning of the bearing plate 81 then results in turning of the closing plate 79 by means of the bolted connections and consequently the steering shaft 75 with the front axle 77 and the front wheels 38 are also turned about the axis 76.

An important advantage of this bearing construction for the steerable front wheels is that the bearing is assembled in a simple and inexpensive manner and can, in addition, be very simply dismantled and reassembled. By removing the bolts 83A between the plates 79, 81 and 83 the steering shaft 75 together with the front wheels can be removed as a single unit without affecting the bearing of the bearing plate 81 in the plates 87 to 89 fastened to the frame. If this bearing is to be dismantled, it is necessary only to release the bolted connections 89A between the plates 87 to 89. The radial support by the balls 90 and the axial support by means of the balls 91 (if provided) ensure low friction operation. The balls 90 and, if any, the balls 91 can be simply exchanged. The bearing described is, moreover, very rugged and rigid, and even after long use play is avoided. During assembly, the bearing does not require accurate adjustment because the bolt holes between the plates 87 to 89 and those in the plates 79, 81, 83 determine the relative positions.

Whilst various features of the tractor that have been described, and that are illustrated in the drawings, will be set forth in the following claims as inventive features, it is to be noted that the invention is not necessarily limited to these features and that it encompasses all of the features that have been described both individually and in various combinations.

CLAIMS

1. A motor vehicle comprising a steerable wheel mounted on an upwardly extending steering member which is releasably secured to a bearing of the steering member.

2. A motor vehicle as claimed in claim 1, in which the steering member is a round tube which is pivotable about its centreline with respect to a frame of the vehicle and which supports the steerable wheel at the lower end.

3. A motor vehicle as claimed in claim 1 or 2, in which a closing plate is rigidly secured to the top end of the steering member, the closing plate being at right angles to the centreline of the steering member.

4. A motor vehicle as claimed in claim 3, in which the closing plate projects beyond the periphery of the steering member and is supported at its edge region on the steering member by buttresses.

5. A motor vehicle as claimed in claim 3 or 4, in which the closing plate projects beyond the periphery of the steering member and has holes at its edge region for releasably connecting the closing plate to a bearing plate disposed above it.

6. A motor vehicle as claimed in claim 5, in which the bearing plate lies on the closing plate and has an edge region projecting beyond the closing plate.

7. A motor vehicle as claimed in claim 5 or 6, in which the thickness of the bearing plate is about 15 mms.

8. A motor vehicle as claimed in any one of claims 5 to 7, in which the bearing plate is made from steel.

9. A motor vehicle as claimed in any one of claims 5 to 8, in which a top plate lies on the bearing plate.

10. A motor vehicle as claimed in claim 9, in which the bearing plate projects beyond the top plate.

11. A motor vehicle as claimed in claim 9 or 10, in which the top plate and the bearing plate have holes which are in register, respectively, with those in the closing plate.

12. A motor vehicle as claimed in claim 11, in which the top plate, the bearing plate and the closing plate are releasably interconnected by means of bolts passing through the holes.

13. A motor vehicle as claimed in any one of claims 9 to 12, in which the outer peripheries of the closing plate, the bearing plate and the top plate are circular and centred on the centreline of the steering member.

14. A motor vehicle as claimed in any one of the preceding claims, in which the bearing comprises a plurality of retaining plates disposed one above the other, balls being disposed between two of the retaining plates.

15. A motor vehicle as claimed in claims 14, in which the retaining plates are made from cast iron.

16. A motor vehicle as claimed in claim 6 or in any one of claims 7 to 15 when appendant to claim 6, in which the projecting edge region of the bearing plate lies between spaced retaining plates which are centred on and extend normal to the

centreline of the steering member, the retaining plates being rigidly secured with respect to a frame of the vehicle.

17. A motor vehicle as claimed in claim 14 to 16, in which the retaining plates are annular and are disposed on both sides of an annular spacer plate, the inner diameter of which exceeds that of the retaining plates.

18. A motor vehicle as claimed in claim 17, in which the thickness of the spacer plate is substantially equal to that of the bearing plate.

19. A motor vehicle as claimed in claim 17 or 18 when appendant to claim 14, in which the balls are disposed between the cylindrical peripheries of the bearing plate and of the spacer plate, these peripheries being centred on the centreline of the steering member.

20. A motor vehicle as claimed in any one of claims 14 to 19, in which balls are disposed between a face of the bearing plate extending normal to the centreline of the steering member and the face of one of the retaining plates for providing clearance between these plates.

21. A motor vehicle as claimed in any one of the preceding claims, in which the outer periphery of the bearing is releasably fastened to a frame of the vehicle.

22. A motor vehicle as claimed in claim 21, when appendant to claim 17, in which the retaining plates and the spacer plate have registering holes with the aid of which these plates are fastened to the vehicle frame by means of bolts.

23. A motor vehicle as claimed in any one of the preceding claims, in which the bearing is fastened to flanges which extend normal to the centreline of two relatively spaced angle members.

24. A motor vehicle as claimed in claim 9 or in any one of claims 10 to 23 when appendant to claim 9, in which the top plate is provided with an arm engaged by a hydraulic ram actuable from a driver's seat of the vehicle.

25. A motor vehicle as claimed in claim 24, in which the arm is rigidly secured to the top plate and extends laterally with respect to the centreline of the steering member.

26. A motor vehicle as claimed in claim 24 or 25, in which the hydraulic ram is pivotally mounted on a frame of the vehicle.

27. A motor vehicle as claimed in any one of claims 24 to 26, in which the arm, the steering member and the wheel are pivotable through about 150°.

28. A motor vehicle as claimed in any one of the preceding claims, in which two wheels pivotable about the same centreline are mounted on the steering member.

29. A motor vehicle as claimed in claim 28, in which the wheels are hydraulically drivable about aligned rotary axes.

30. A motor vehicle as claimed in any one of the preceding claims, in which the steering member is situated at the front of the vehicle.

31. A motor vehicle as claimed in any one of the preceding claims, in which an engine having a power of about 60 to 100 kw is provided.

32. A motor vehicle as claimed in any one of the preceding claims, in which the diameter of the wheels of the vehicle is about 135 cms.

33. A motor vehicle as claimed in any one of the preceding claims, in which four wheels with pneumatic tyres are provided, the width of the tyres being about 60 cms.

34. A motor vehicle as claimed in any one of the preceding claims, having a width of about 300 cms.

35. A motor vehicle as claimed in any one of the preceding claims, in which a cab is provided, having a sidewall, at least the rear part of which extends sideways and outwards.

36. A motor vehicle as claimed in any one of the preceding claims, in which a cab is provided having a rear screen, of which the height is smaller than the width.

37. A motor vehicle as claimed in any one of the preceding claims, in which a cab is provided having at least one screen which is hydraulically movable.

38. A motor vehicle as claimed in any one of the preceding claims, in which the cab is provided having a floor panel made from a material other than metal.

39. A motor vehicle as claimed in any one of the preceding claims, in which a cab is provided in which a driver's seat is situated, the driver's seat having a back which is pivotable through about 45° in a manner such that a driver of the vehicle can actuate apparatus outside the cab through an opening in a rear screen.

40. A motor vehicle as claimed in any one of the preceding claims, in which a cab is provided which has a mirror covering a larger width than the track width of two front wheels of the vehicle.

41. A motor vehicle as claimed in any one of the preceding claims, in which a cab is provided in which a driver's seat is situated, a roof of the cab, on one side of the driver's seat, having an air-conditioner which communicates with an air inlet in the rear wall of the cab, the air inlet being broader than the air conditioner.

42. A motor vehicle as claimed in any one of the preceding claims, which comprises an agricultural tractor comprising an engine, a frame, a lifting device and a power take-off shaft.

43. A motor vehicle as claimed in claim 42, in which a top arm of the lifting device is provided with a lever or other means to enable said lifting arm to be operated from a driver's seat of the tractor.

44. An agricultural tractor substantially as described herein with reference to, and as shown in, the accompanying drawings.

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